Staphylococcus aureus bacteremia (SAB) is of great concern worldwide due to the frequently fatal outcome, or endocarditis as a dreaded complication with a one-year mortality rate of 30–40%. Multiple factors increasing the risk of SAB have been identified, but whether socioeconomic status is associated with the adult risk of SAB or subsequent endocarditis has not been established. Further, knowledge on risk factors in the pediatric population is sparse and the current literature is limited by small numbers of patients and study design. Additionally, to the best of our knowledge a possible familial clustering of SAB has never been investigated. To improve future diagnosis, treatment and prognosis for patients with SAB, identification of exposures associated with increased rate of the disease, are essential to ensure early diagnosis. Moreover, a familial clustering of SAB would point towards a possible genetic component in the human susceptibility to S. aureus.

We cross-linked national registries at an individual level by use of each individual’s personal identification number to obtain information on demographics, education, comorbidities, medication, surgical procedures, family relations, and microbiologically verified SAB.

The main results of this thesis were: Paper I) in adults, a low socioeconomic status was associated with an increased risk of SAB, and this association declined with advancing age. The level of socioeconomic status did not influence the risk of subsequent infective endocarditis in patients with bacteremia. Paper II) In children aged 5–18 years, the highest rates of SAB were observed in children receiving dialysis or plasmapheresis, transplanted children, children with cancer, congenital heart disease, atopic dermatitis and in children with recent surgery. However, more than every third child with bacteremia were presumably healthy prior to the hospital admission for SAB. Neither parental socioeconomic status nor prematurity were associated with the risk of SAB in these children. Paper III) Having a first-degree relative previously hospitalized with SAB was associated with a more than two-fold increased rate of the disease compared with the background population. The highest risk of acquiring the bacteremia was observed if a first-degree relative was a sibling with non-hospital acquired SAB. Contagion could probably not explain our findings, since the causative S. aureus strain differed genetically in more than 80% of the infected families, and no increased risk was observed in spouses.

Knowledge on risk factors for SAB in both adults and children (Paper I and Paper II) may increase the awareness of the disease, thus improving early diagnosis and correct treatment. Lastly, knowledge on familial clustering of the disease can pave the way for future clinical genetic studies leading to prevention of familiar clustering.
To fulfill the requirements for the PhD degree, Louise Bruun Østergaard has submitted the thesis: Staphylococcus aureus bacteremia – host factors influencing the human infection risk, to the Faculty Council of Medicine at Aalborg University. The Faculty Council has appointed the following adjudication committee to evaluate the thesis and the associated lecture:

**Professor Pierre Tattevin**  
Centre Hospitalier Universitaire de Rennes  
France

**Dr.med. Jannik Helweg-Larsen**  
Copenhagen University Hospital  
Denmark

**Chairman:**  
Clinical Professor Henrik Nielsen  
Aalborg University Hospital  
Denmark

**Moderator:**  
Professor Christian Torp-Pedersen  
Aalborg University  
Denmark

The PhD lecture is public and will take place on:

**Monday 04 March 2019 at 14:00**  
Gentofte Hospital  
Store Auditorium, Stairway 10 & 10A  
Kildegårdsvej 28  
2900 Hellerup  
Copenhagen

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**Program for PhD lecture on**

**Monday 04 March 2019**

by

Louise Bruun Østergaard

Staphylococcus aureus bacteremia – host factors influencing the human infection risk

Chairman:  
Clinical Professor Henrik Nielsen

Moderator:  
Professor Christian Torp-Pedersen

14.00  
Opening by the Moderator

14.05  
PhD lecture by Louise Bruun Østergaard

14.50  
Break

15.00  
Questions and comments from the Committee  
Questions and comments from the audience at the Moderator’s discretion

17.00  
Conclusion of the session by the Moderator

After the session a reception will be arranged